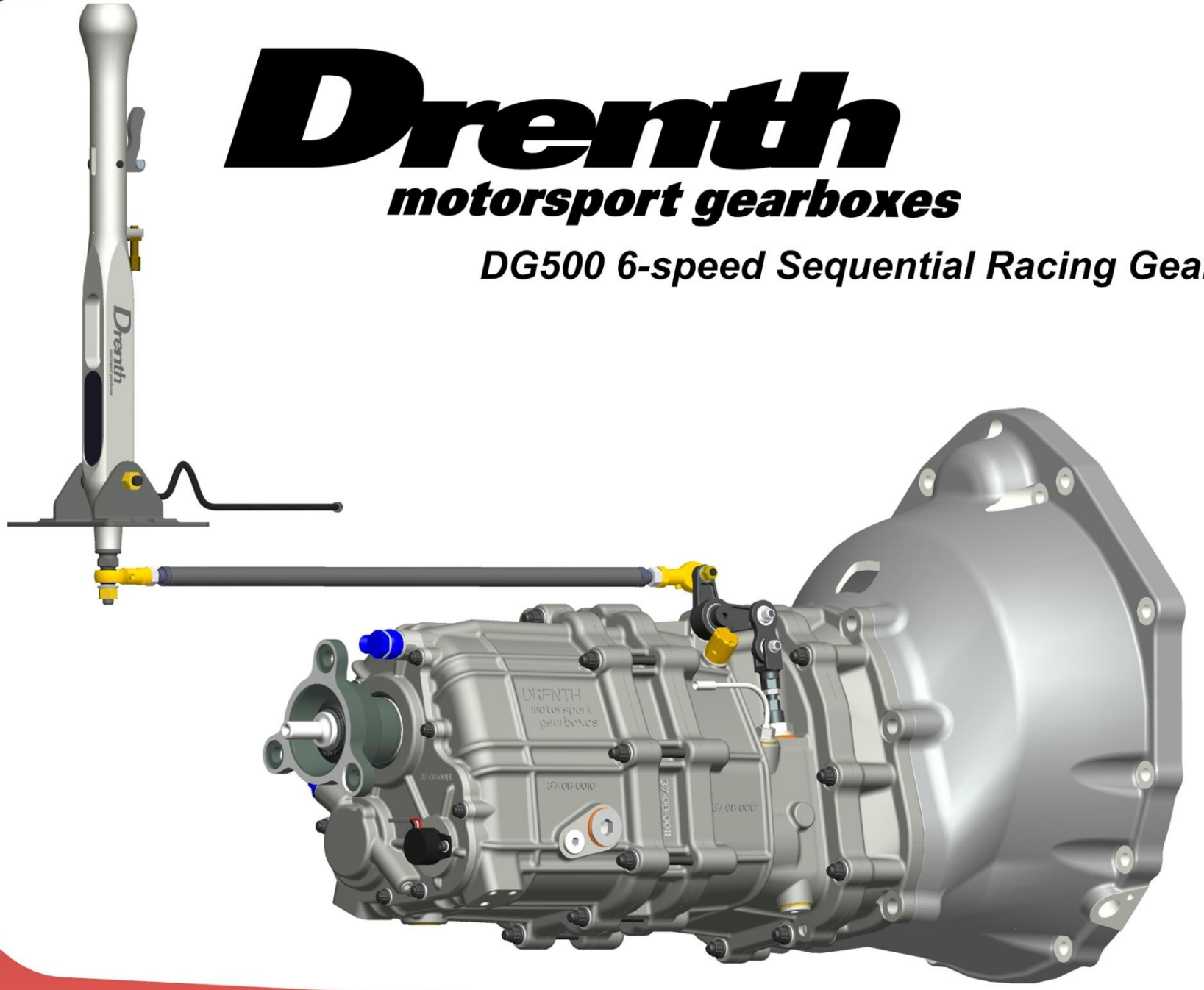
Drenth

motorsport gearboxes

DG500 6-speed Sequential Racing Gearbox



Pole Position
In gearboxes

25.03.0026

Introduction

The Drenth Gearbox 500 (DG500) 6-speed sequential racing gearbox is originally developed for the BMW M3 E92, but due to its design specifications it fits into almost any rear wheel driven car. The gearbox can handle torque levels up to 650 Nm and has a dry weight of 39 kg. With his adaptive capability the gearbox can be used in several disciplines like: circuit racing, endurance racing, hillclimb, rally-(raid) and rallycross.

This document contains information about the DG500 gearbox. It includes Technical specifications, gear ratio sets list and possible options. For more detailed information please contact Drenth Gearboxes.

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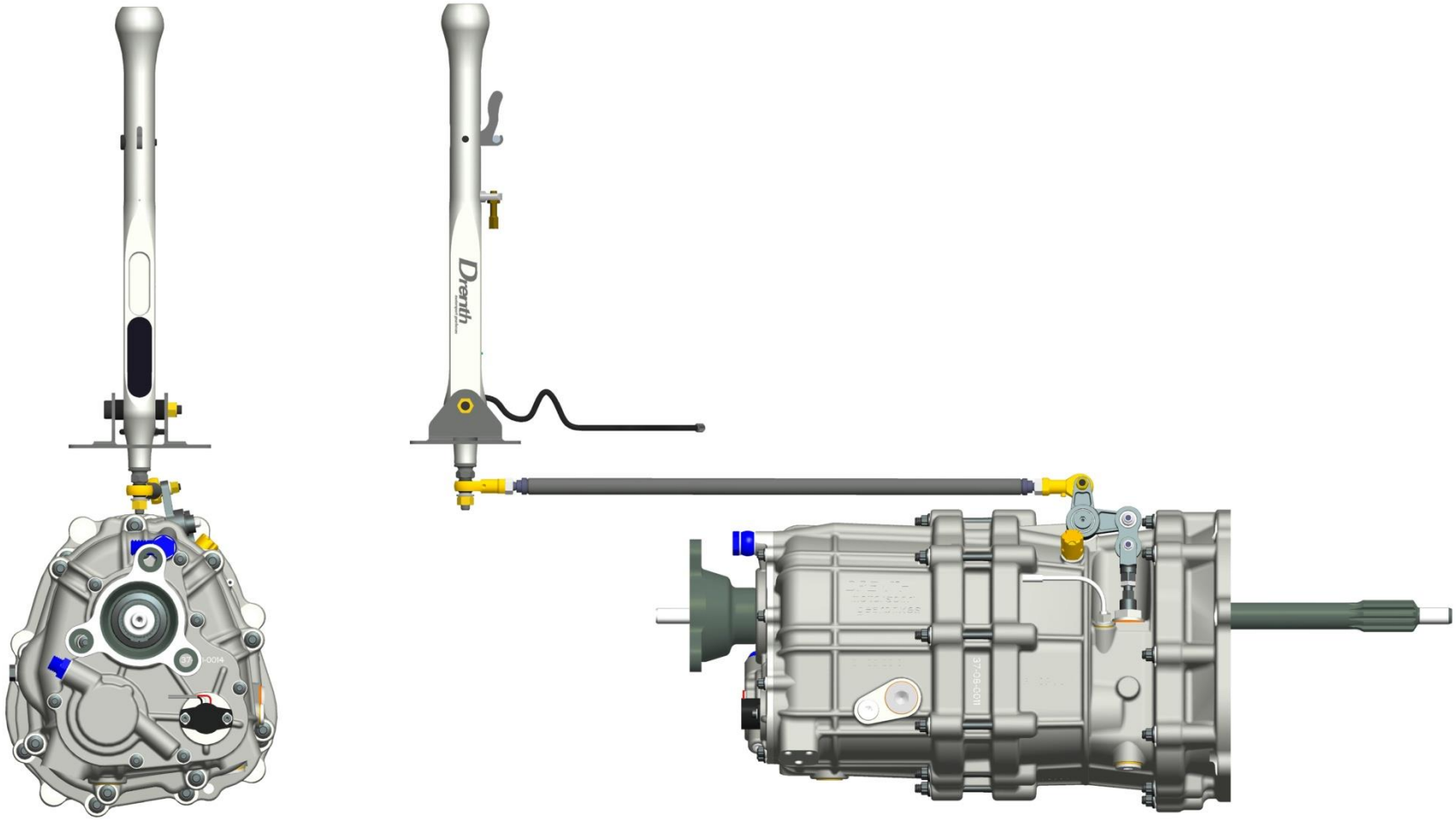
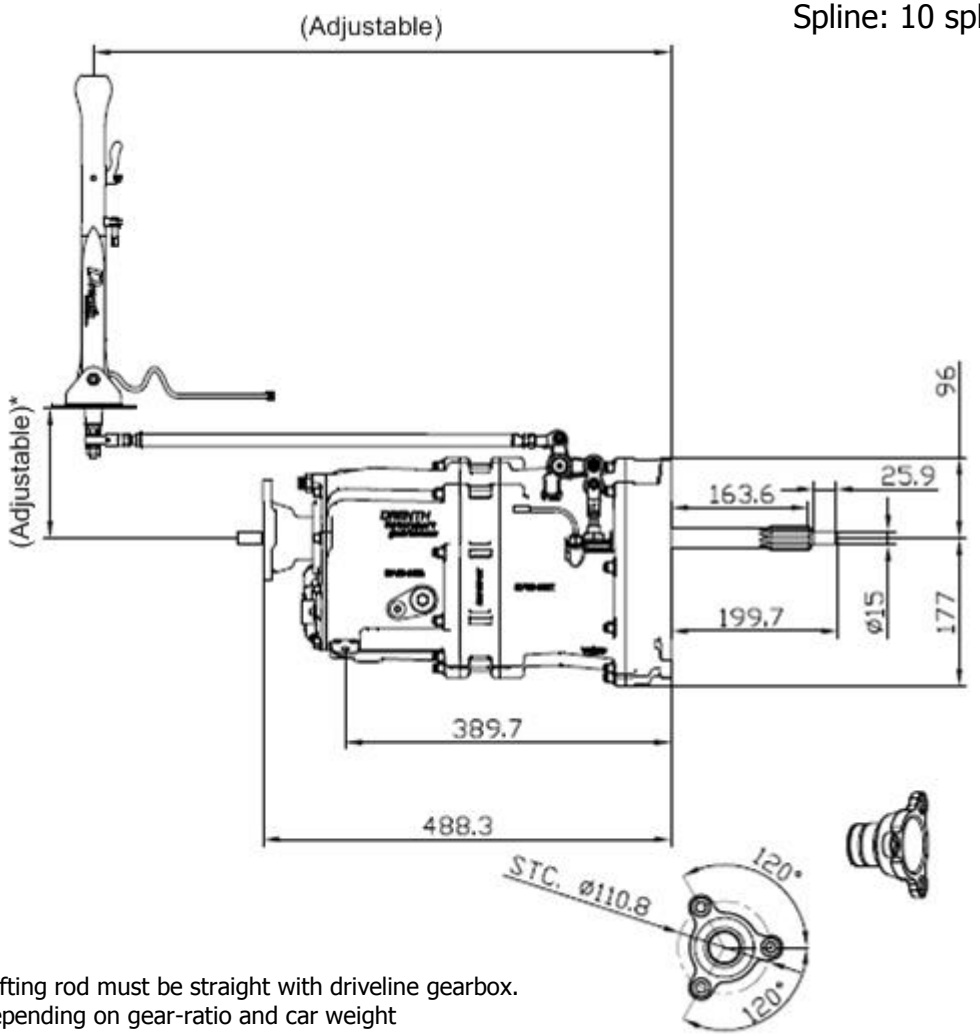


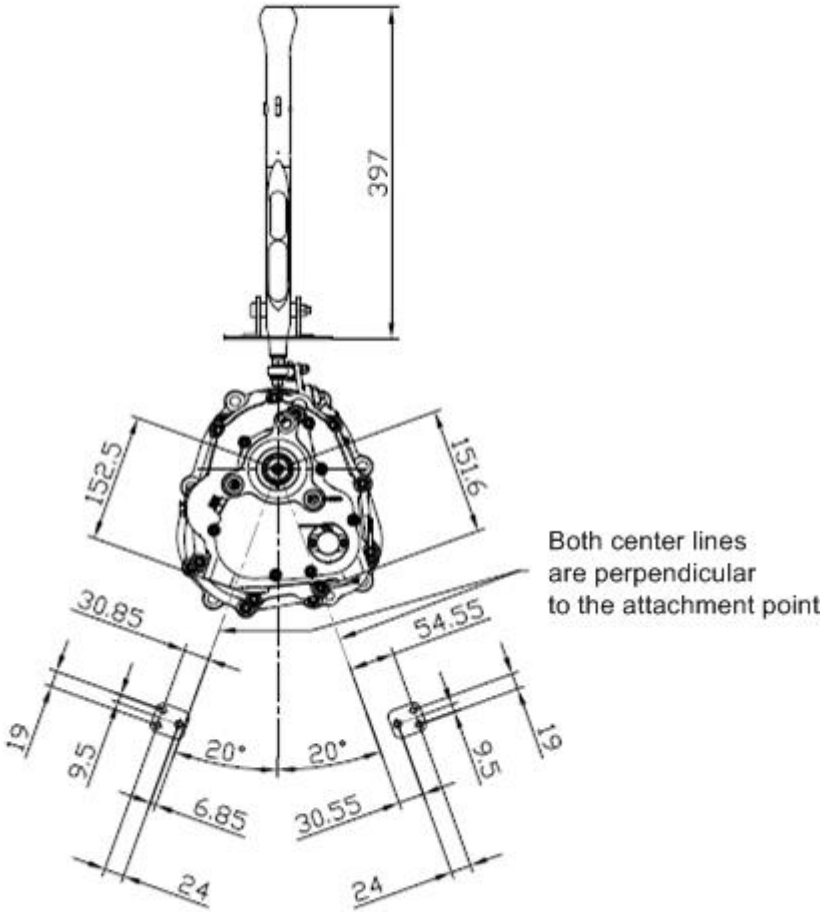
Figure 1:
Rear and side view

Technical Specifications

General Dimensions

Dimensions:	Weight:	Max. torque:	Spline:	Oil qty:	Oil Type:
BMW M3	39 Kg	650Nm**	BMW M3 Spline: 10 spline 1⅛"	1.8 litres (Without oil cooler)	Castrol SAFX-J





* Shifting rod must be straight with driveline gearbox.
**Depending on gear-ratio and car weight

Figure 2:
General dimensions

The DG500 output shaft is also available with an Ford type flange shown in figure 3.

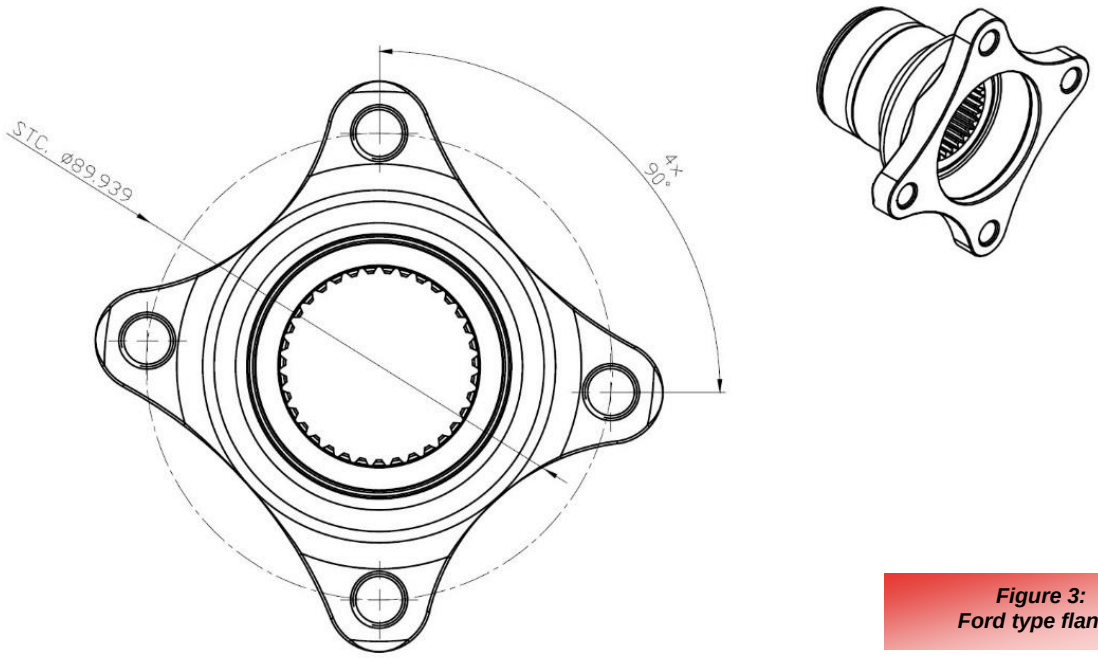


Figure 3:
Ford type flange

Cross-Section

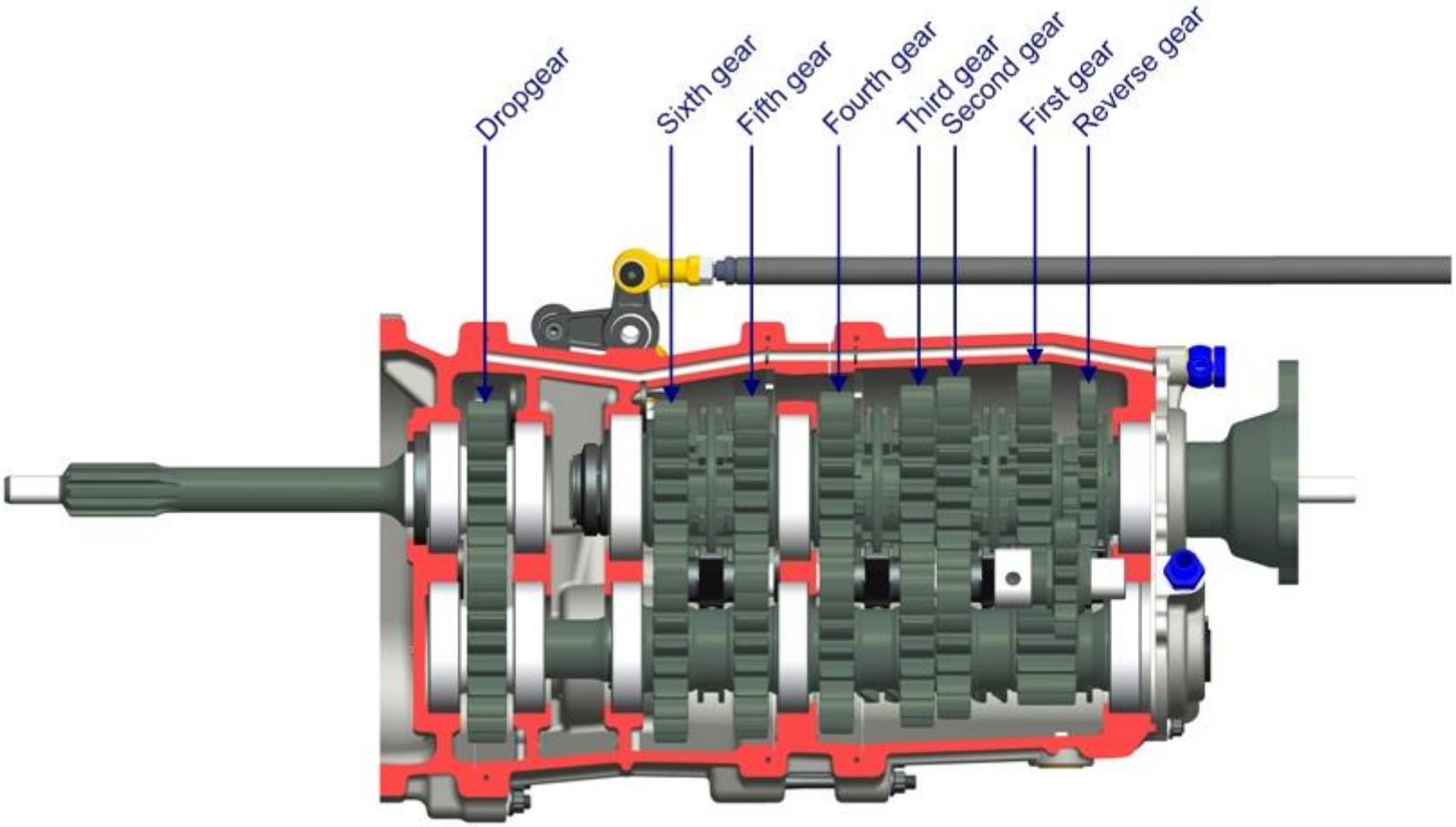


Figure 4:
Cross-section

Lubrication System

- Pump type: 10 tooth Gerotor.
- Filter type: There are two different filters in the oil system:
  - A pressure filter after the pump that can be integrated in the oil system (optional).
  - A normal filter on suction side integrated in gearbox.
- Pump location: Oil pump is located on the lower side of the rear end cover.
- The spray bar is integrated in the housing sections of the gearbox and sprays on all the gears and dogrings of the outputshaft and on the upper dropgear.
- There are two connections to fit an external oil cooler. For more information see the next page.
- Recommended oil specification:
  - Castrol SAF-XJ
  - API GL-5
  - SAE 75W-140
- Oil Capacity: Without oil cooler and external oil lines; 1.8 litre.

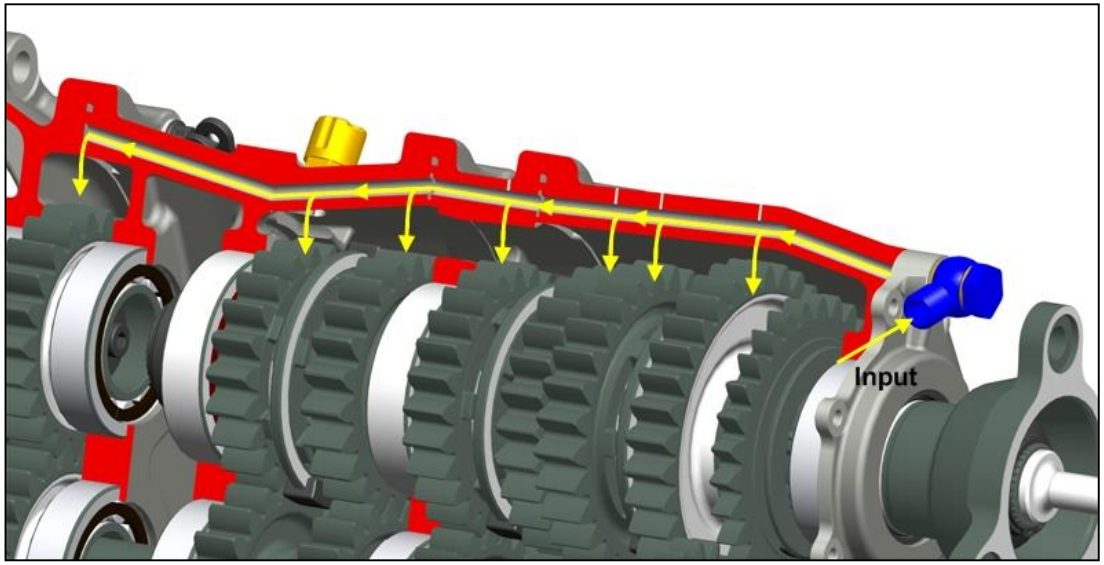


Figure 5:
Lubrication system

Placement Oil Cooler

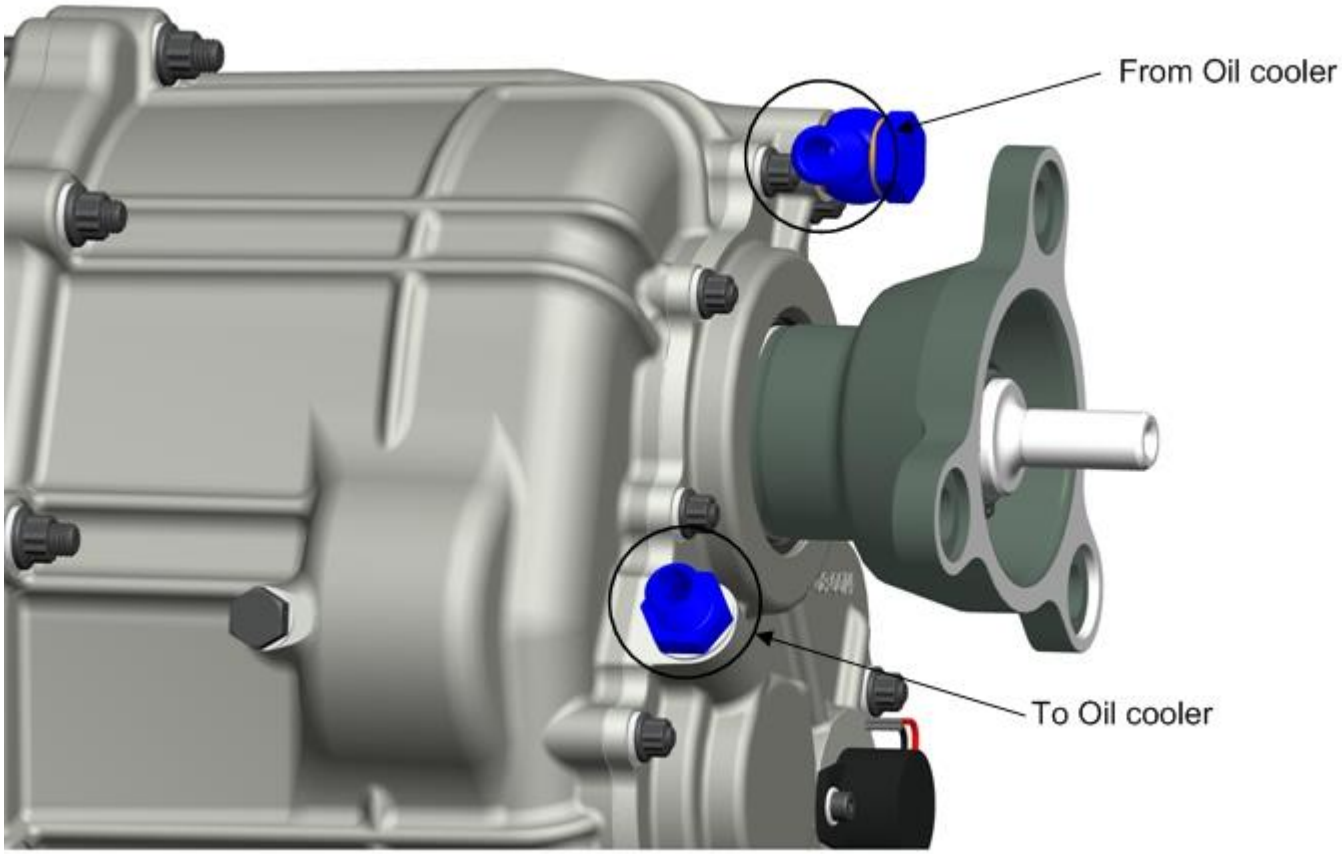


Figure 6:
Oil cooler placement

Run-in Procedure

- Run through the gears while the gearbox is not mounted underneath the car. Also check if the gear indicator shows the correct information while going through the gears. If not check the calibration of the potentiometer.

- When this is working and the oil level is correct (1.8 litre), the gearbox can be mounted on a test bench or underneath the car. For the first test the wheels should be tilted from the ground. Before the test run make sure that the gearbox is in the neutral position. During the test run go through all the gears in a low rpm range. When the temperature starts to rise, the engine rpm may also go up. The temperature and the rpm build-up must go up evenly and check the given information on the gear indicator. During the run also concentrate on the noise production, vibrations and the temperature. When one of them is out of the ordinary, stop the test and see what could be wrong. The first test is done when all is operating correctly and the gearbox has reached its operating temperature.

- After the first test the gearbox is ready for a test drive. The procedure is the same as the first test. Slowly build-up the engine rpm and torque when the temperature level starts to increase. During the warm-up of the gearbox don't warm-up the brakes.

Gear Ratio list

Primary shaft	All gear ratios					
1st gear	**2nd, 3th, 4th, 5th, 6th gear**					
2.538	2.125	1.875	1.667	1.556	1.389	1.083
	2.067	1.833	1.579	1.529	1.316	1.048
	2.000	1.778		1.500	1.250	0.955
	1.938	1.750		1.471	1.190	0.855
		1.722		1.421	1.130	

Part numbers dropgear ratios	
Part number	**Dropgear**
37.08.2100	1.048
37.08.2101	0.955
37.08.2102	1.000
37.08.2103	0.920
37.08.2104	1.086
37.08.2105	0.885
37.08.2106	1.130

Short ratio primary shaft:	
1st gear	**2nd gear ****
3.000	2.067
	2.125*
	2.214*
	2.286
	2.333*
	2.538*

- Different gear ratios available on request
- Ratio requests from customers will be added to the list
- In consultation with the customer the ideal ratios can be calculated

** No stock item, On request*
*** Fixed on shaft*

A common used gear ratio sets for the BMW E92						
Part number	**1st gear**	**2nd gear**	**3rd gear**	**4th gear**	**5th gear**	**6th gear**
37.08.2000	2.538	1.750	1.389	1.190	1.048	0.955
37.08.2001	2.538	1.938	1.529	1.25	1.048	0.955
37.08.2002	2.538	1.750	1.421	1.19	1.048	0.955
37.08.2003	2.538	1.875	1.500	1.250	1.083	0.95
37.08.2004	2.538	1.938	1.579	1.316	1.130	1.000
37.08.2010	3.00	2.067	1.667	1.389	1.190	1.048

Also Included

D.M.S. Gearlever

- The D.M.S. gearlever has got a built-in strain gauge which constantly gives several signals. These signals can be used for up and down shifting and other functions. The up shift signal can be used in combination with the Drenth display unit (see chapter 'Options' for more information about the display unit). The other signals can be used in combination with a aftermarket ECU such as a Motec, TDA or Gems.

- There are two different D.M.S. gearlevers available, the short version and the long version.

- Short version: 37.02.0905, Length: 240 mm from mounting position
- Long version: 37.02.0901, Length: 360 mm from mounting position

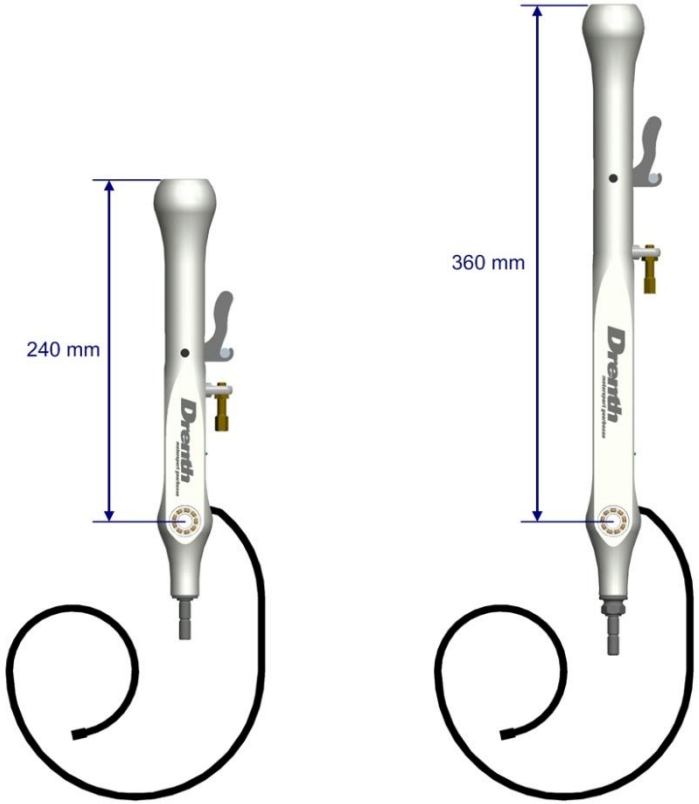


Figure 7:
Dimensions gearlever

Options

Mounting Bracket

- There's a bracket available (nr. 3 and 4) which is specially developed for the BMW M3 E92 and fits directly on the original rear support bracket (1) of the BMW.
- The standard rubber support blocks (2), if wanted, can also be changed to soot the car specifications
    - Aluminium blocks (for circuit racing)
    - Hard plastic block (for rally-(raid))

Number	QTY.	Part number	Description
1	1	Original on BMW	
2	2	Original on BMW	
3	1	37.08.0500	Right bracket
4	1	37.08.0505	Left bracket
5	2	37.08.0507	Aluminium block
6	2	37.08.0508	P.O.M. block

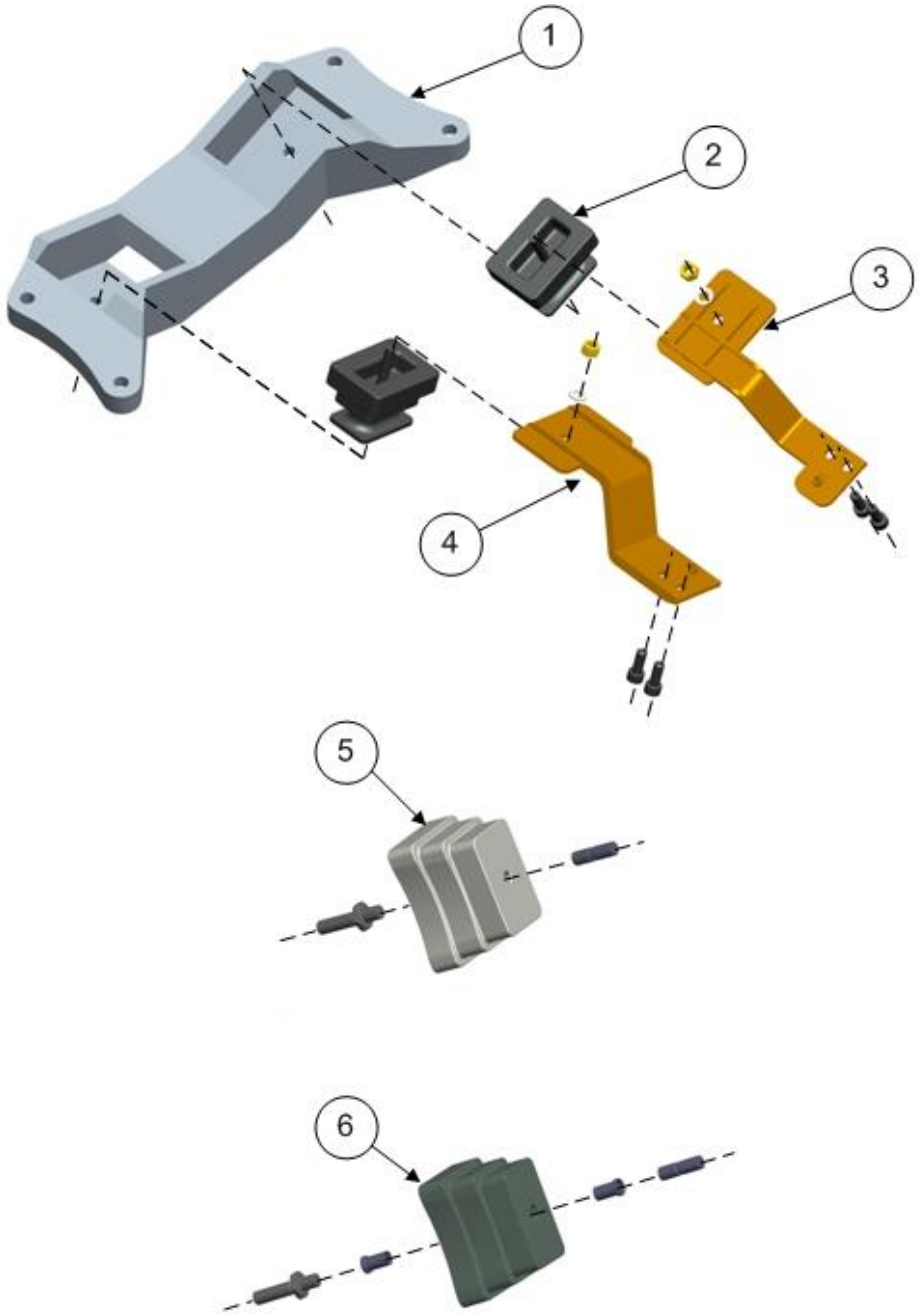
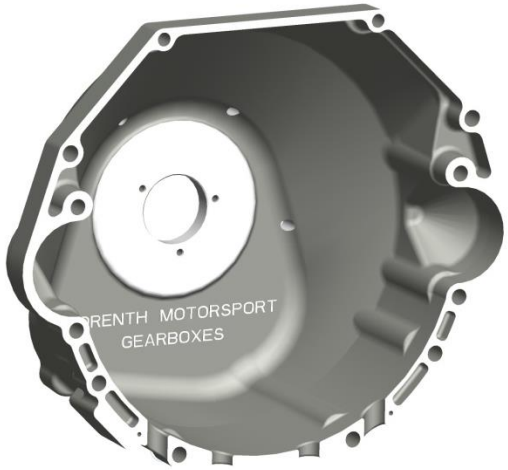


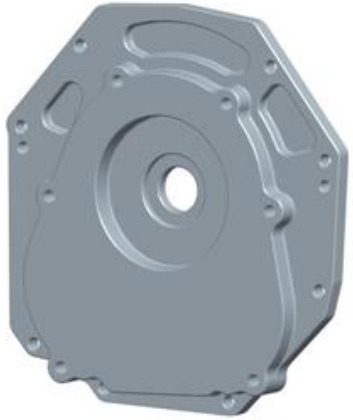
Figure 8:
Mounting bracket

Gearbox Fit

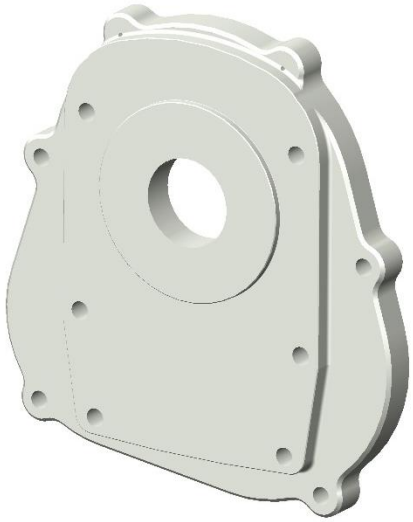
- Left: Bell housing for the BMW M3 E92 S65 engine, 37.08.0600
- Right: Bell housing for the BMW S62 engine, 37.08.0604

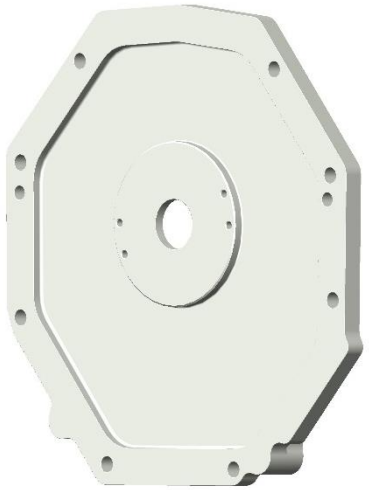


- Left: Example adaptor plate for any engine application. Given a plate for Corvette application.
- Right: Bell housing and adaptor plate for the BMW S54 engine, 37.08.0160



- Left: Example adaptor plate for the Ginetta G50 Bellhousing (Tremec), 37.08.0181
- Right: Example adaptor plate for the Tremec T56 Ford Bellhousing, 37.08.0176





Drenth Display Unit

The display unit houses several functions to adjust to the driver's needs and to fine-tune the gearbox.

The gear indicator displays the selected gear by measuring the position of the selector barrel with a rotary sensor. This function can be calibrated through the supplied software. It also can be used as a shift light when a preset level of RPM is reached. This preset level and the manner of indicating can be set with the supplied software.

The gear indicator, combined with the D.M.S gearlever, can act as a flatshift system (powershift) This means that you can accelerate (full throttle) and shift up without using the clutch or lifting the throttle. This can also be calibrated with the supplied software.

The set comes with a separate user manual. For more information contact our sales department or visit our website.

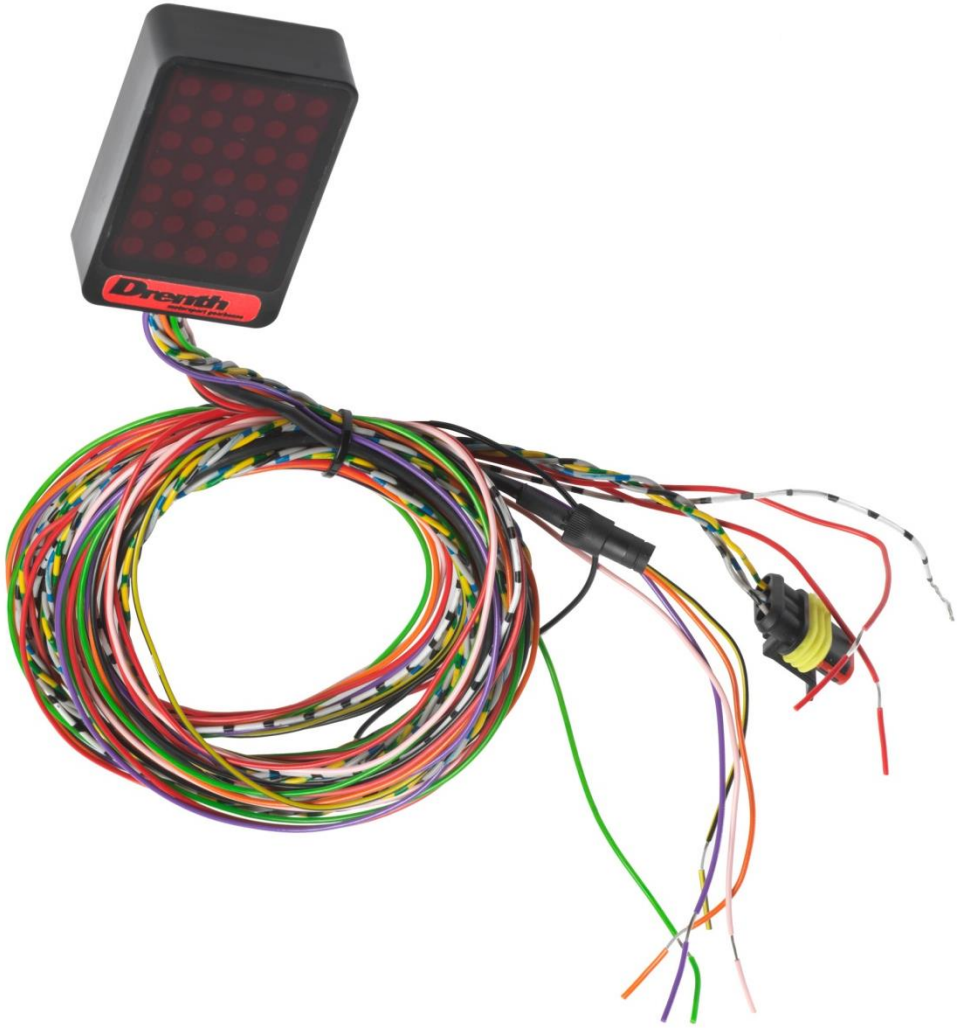


Figure 9:
Display unit

Drenth Gear Indicator

The Drenth Gear indicator is a display unit that can be used with any Drenth gearbox with a rotary sensor. Any gear order can be accommodated with up to 7 forward speeds besides neutral and reverse.

Programming the unit is achieved by the use of a single button and a user-friendly programming routine. Additionally, the unit features a counter to log the total number of gearshifts made – useful for tracking the life of critical gearbox components. .
The set comes with a separate user manual. For more information contact our sales department or visit our website.

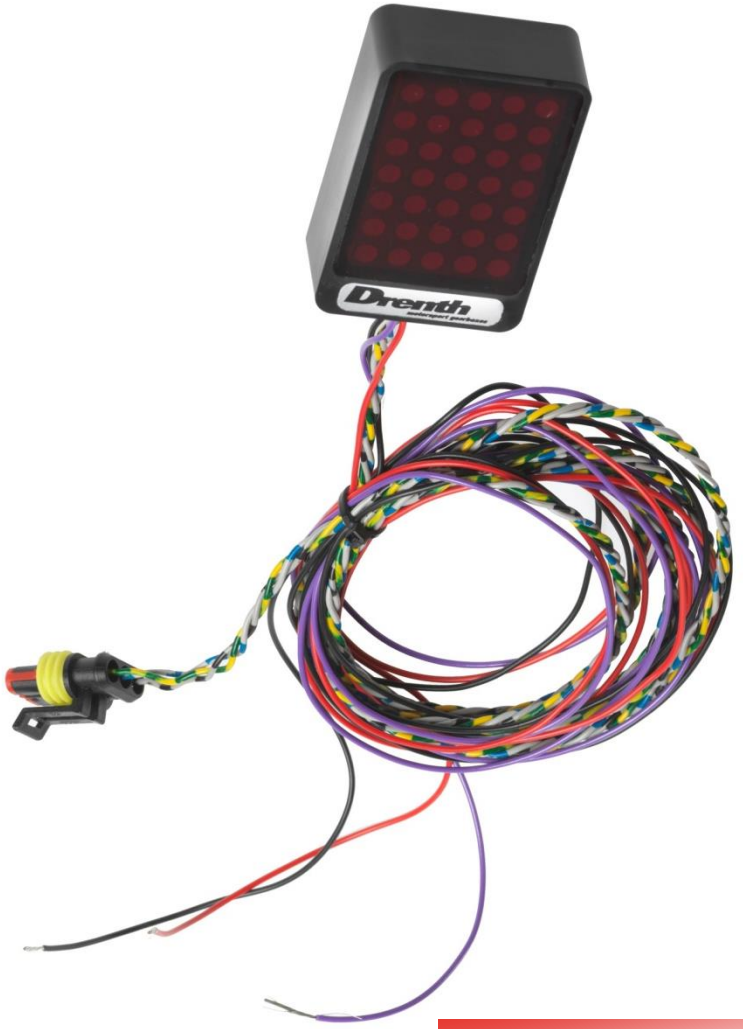


Figure 10:
Display unit

Gearbox Position

The DG500 gearbox can be mounted directly on to the engine, but it's also possible mount the gearbox more to the rear of the car. For this application a different selector drum and positioner is needed.

- Gearboxes placed behind of the gearlever position:
    - Selector drum: 37.08.0080 and positioner: 37.08.0023
- Gearbox placed in front of the gearlever position:
    - Selector drum: 37.08.0151 and positioner: 37.08.0150
- Gearbox extension unit; when the gearbox is placed more to the rear of the car, we can also provide a tunnel extension and a longer inputshaft. For more detailed information please contact Drenth Motorsport Gearboxes.

Figure 11:
Selector drum and positioner

Oil breather catch tank

The DG500 gearbox needs an oil breather system for breathing the gearbox.
Drenth gearboxes recommends an oil breather catch tank for breathing the gearbox.

The following breather catch tank with the corresponding parts suits for a Drenth gearbox.

The tank needs to be placed vertical and above the gearbox for a smooth return of the oil.
For mounting the tank there are two 6 mm holes, the hose needs to be cut to size.

For more information, please contact our sales department.

The system consist of:

Description	QTY.	Part Number
Complete oil breather catch tank	1	25.03.0200
Oil breather catch tank	1	25.03.0201
Adaptor (hose)	2	25.03.0203
Oil hose (1 m)	1	25.03.0202

Figure 12:
Oil breather catch tank

Paddle shift systems

Several aftermarket paddle shift systems are available for the DG500 sequential gearbox. Drenth offers gearlevers and mounting brackets which are fitted to shift cylinders supplied by Geartronics (example shown in Figure 13), KMP Paddleshifts and Shiftech.

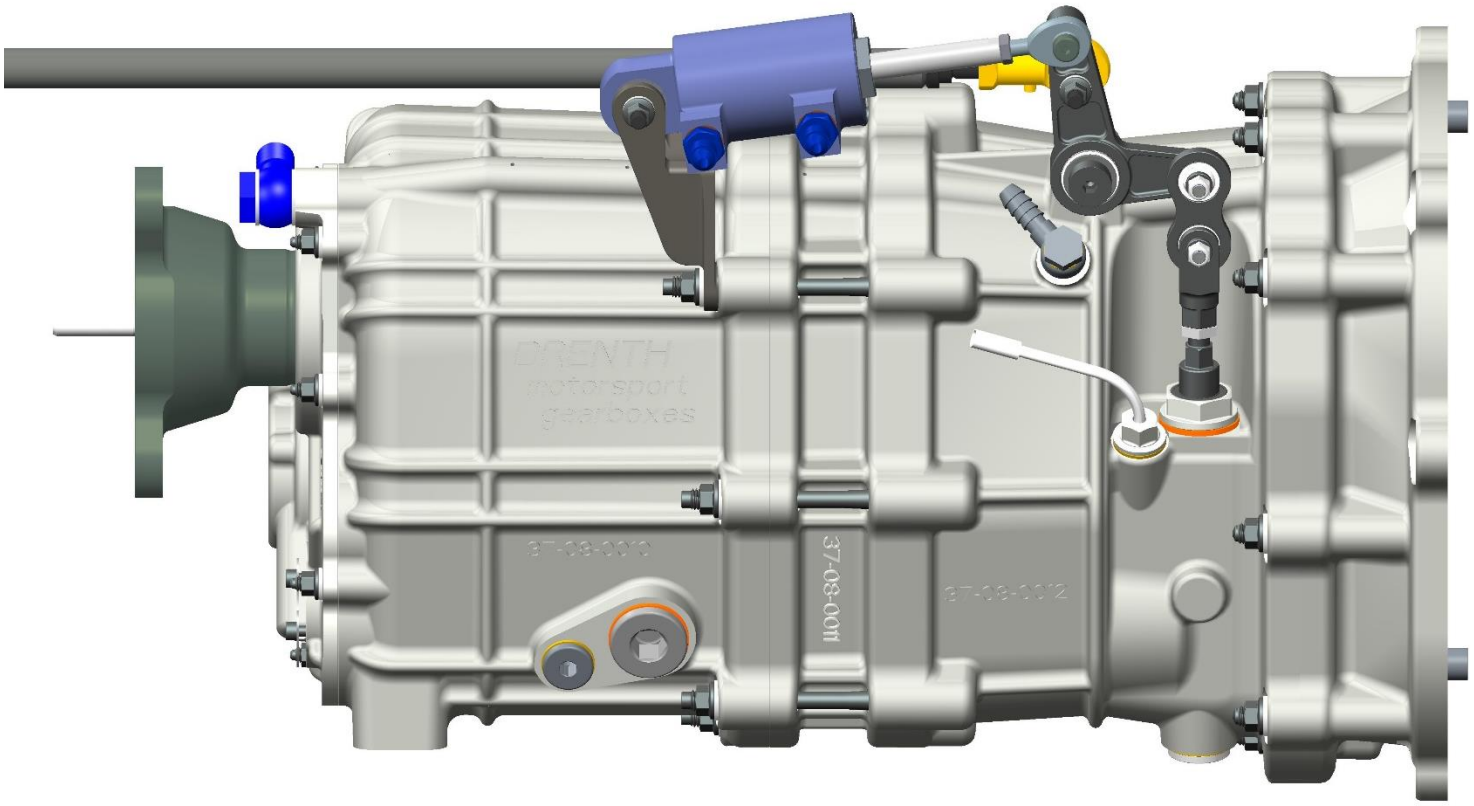


Figure 13:
Geartronics paddle shift assembly

Contact Information

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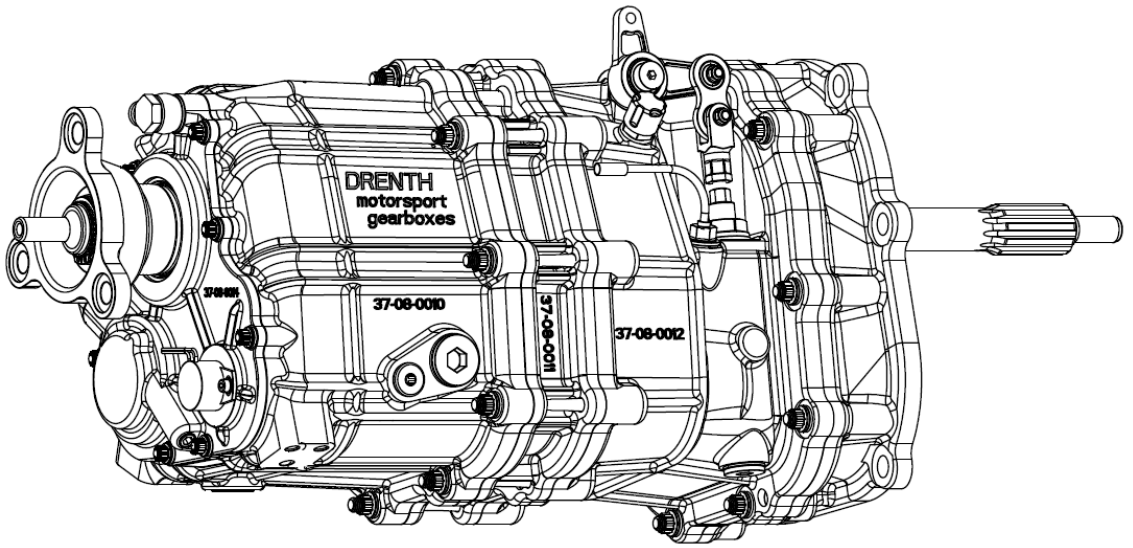

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